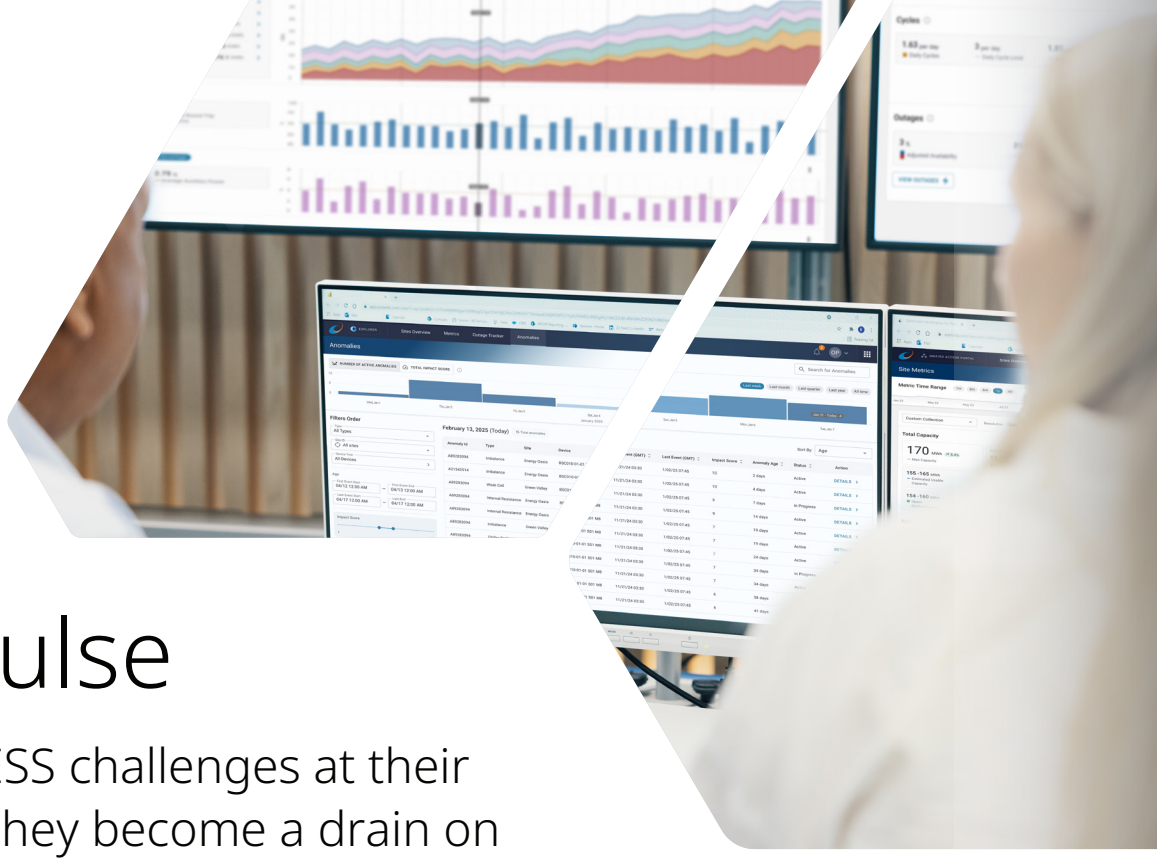


GEMS Pulse

> Addressing BESS challenges at their root—before they become a drain on revenue or performance.

Wärtsilä Energy Storage's GEMS Pulse is an advanced cloud-hosted analytics engine that transforms raw system data into actionable insights, enabling users to keep a pulse on their entire system to enhance revenue and performance potential from cell to fleet.

In energy storage systems, millions of data points are collected every second, including state of charge (SoC), state of health (SoH), cell imbalance, thermal performance, and available capacity. Traditional data management and control systems often leave this valuable information siloed and underutilised.

GEMS Pulse breaks down these silos, turning data into tangible revenue gains.

- Addresses challenges like trapped capacity and equipment availability by optimising performance across both individual sites and entire portfolios.
- Optimises asset performance while identifying potential anomalies, reducing downtime and minimising the risk of asset failure.
- Empowers asset operators to evaluate their dispatch strategies with scenario generation tools, comparing asset revenue with long-term degradation.

There's power in numbers.

5+ years
of data across 100+ global energy storage projects

In-house experts
in data science, analytics, thermal and battery technology

2 battery labs
for in-depth cell to system validation

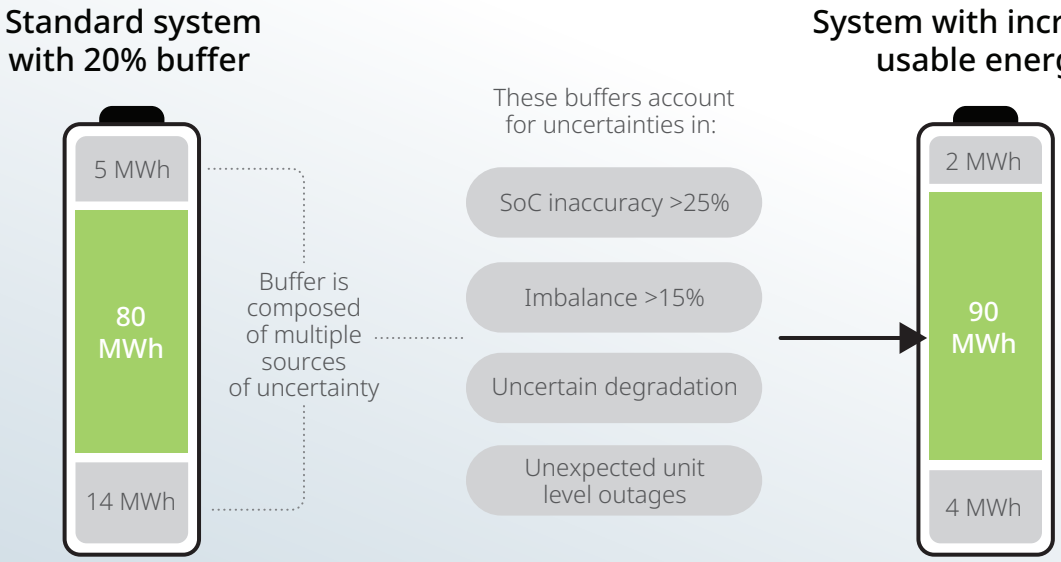
1M+ data points per second
Tightly integrated with BESS hardware and GEMS products for a real-time feedback loop between insight and control

Accurate SoC, SoH, and cell imbalance measurement

Stop losing energy—and revenue—to measurement errors

Problem

Energy storage operators often leave up to 20% of capacity unused to account for uncertainty around cell health and available energy.



Solution

GEMS Pulse reduces reserve buffers by delivering high-confidence measurements of cell imbalance and degradation, combined with automated SoC calibration through the GEMS PPC. This increases usable energy.

By continuously monitoring cells, modules, and strings, GEMS Pulse detects abnormal imbalance and weak cells early before they impact trading operations. The resulting increase in usable capacity enables more accurate market participation strategies, unlocking additional revenue.

Financial impact

A 5% SoC error for a battery operating in the UK market can cause a £10K / MW lost revenue on a 100 MW / 200 MWh system. Over the course of a year the revenue loss could be over £1M – meaning up to £15-20M in losses over the asset's lifetime.

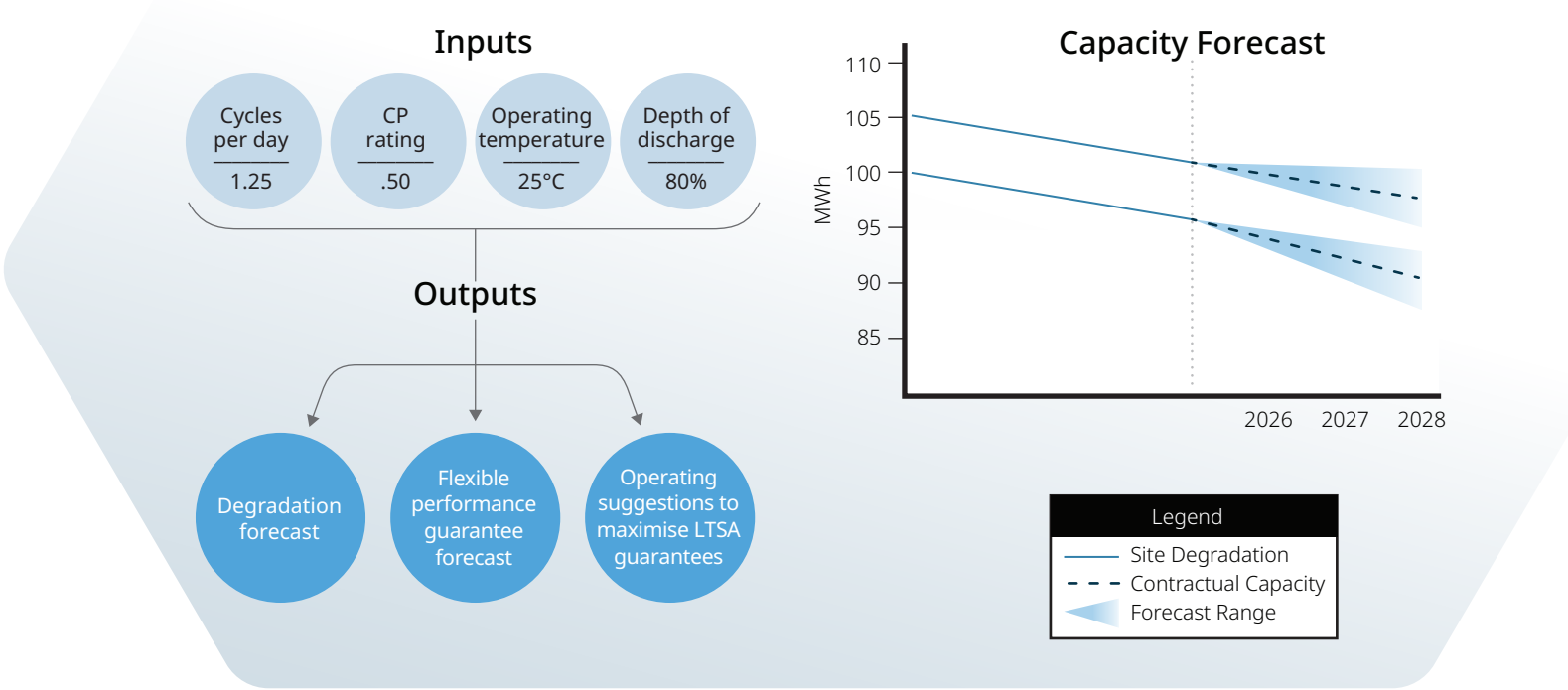
GEMS Pulse drives precision to optimise asset-level revenue capture.

Capacity planning

Don’t leave your investment up to chance

Asset operators can now understand the impact of dispatch strategies—either before or after deploying them—on degradation, warranty, and asset efficiency. This gives them full control around how to leverage the power of their system to reach their goals with a comprehensive understanding of the trade-offs.

How it works



Real-world impact

On the ground, scenario generation with GEMS Pulse uncovered an identical degradation but more revenue at 1.33 cycles/day and 80% DoD vs. 1 cycle per day and 100% DoD for an operating battery.

With a better understanding of a battery’s behaviour and health, asset operators can make more informed decisions about their dispatch strategies to enhance performance and increase revenue.

Contact us today to learn how GEMS Pulse can optimise your next project.

www.wartsila.com/energy/energy-storage